IN THE CLAIMS:

Please re-write the claims as follows:

1. (Currently Amended) A method for programming a pattern matching engine having a plurality of information storage entries with one or more regular expressions, each regular expression including a plurality of characters and having a corresponding action to be applied to matching strings, the method comprising the steps of:

identifying one or more borders within a given regular expression, the one or more borders separating the given regular expression into a plurality of sub-expressions, at least one sub-expression having a plurality of sequential characters; and

loading one or more entries of the pattern matching engine with a plurality of the sequential characters from at least one sub-expression, wherein the borders are defined by a predetermined sequence of regular expression metacharacters, the entries stored in content addressable memory (CAM).

2. (Currently Amended) The method of claim 1 wherein the predetermined sequence of regular expression metacharacters ~~are a wildcard metacharacter~~ is a first regular expression metacharacter defined to match any one character followed immediately by a second regular expression metacharacter defined to match the preceding ~~repeat last~~ character zero, one, or more times ~~metacharacter~~.

3. (Original) The method of claim 1 further comprising the step of organizing at least part of the pattern matching engine into a plurality of sections, and wherein each section of the pattern matching engine is loaded with a plurality of search patterns for a corresponding sub-expression.

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4. (Currently Amended) The method of claim 3 wherein the entries of a given sec-
tion are loaded with ~~one of~~ a search pattern that includes a complete match of the respec-
tive sub-expression, a search pattern that includes a partial match of the respective sub-
expression, and a mismatch pattern.

5. (Original) The method of claim 4 further comprising the steps of:

associating at least one sub-expression with a current state variable; and

loading the associated current state variable into each entry of the section of the

pattern matching engine that contains the at least one sub-expression.

6. (Original) The method of claim 5 wherein the pattern matching engine has at

least one content addressable memory (CAM) loaded with the one or more regular ex-

pressions.

7. (Currently Amended) The method of claim 6 wherein

the CAM is a ~~ternary content addressable memory (~~TCAM~~)~~ that supports don't

care values, and

~~the mismatch pattern includes all don't care values~~

each regular expressions loaded to the CAM is loaded as a plurality of search pat-

terns including a mismatch pattern having all don't care values.

8. (Currently Amended) ~~The method of claim 7 wherein~~ A method for program-

ming a pattern matching engine having a plurality of information storage entries with one

or more regular expressions, each regular expression including a plurality of characters

and having a corresponding action to be applied to matching strings, the method compris-

ing the steps of:

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6   <u>identifying one or more borders within a given regular expression, the one or</u>

7   <u>more borders separating the given regular expression into a plurality of sub-expressions</u>

8   <u>wherein at least one sub-expression has a plurality of sequential characters;</u>

9   <u>defining one or more search patterns for each sub-expression having one or more</u>

10   <u>borders containing a predetermined sequence of regular expression metacharacters, the</u>

11   <u>predetermined sequence of regular expression metacharacters containing a first regular</u>

12   <u>expression metacharacter defined to match any one character followed immediately by a</u>

13   <u>second regular expression metacharacter defined to match the preceding character zero,</u>

14   <u>one, or more times;</u>

15   ~~each regular expression is associated with an action;~~

16   <u>including at</u> the pattern matching engine ~~further includes~~ <u>at least one ternary con-</u>

17   <u>tent addressable memory (TCAM) for loading one or more regular expressions and sup-</u>

18   <u>porting don't care values, and a second memory device</u> having a plurality of entries~~, and~~

19   <u>for loading</u> ~~the entries of the second memory device are loaded with the~~ <u>actions corre-</u>

20   <u>sponding to the one or more regular expressions;</u>

21   <u>organizing at least part of the TCAM into a plurality of sections wherein each sec-</u>

22   <u>tion of the TCAM is loaded with a plurality of search patterns for a sub-expression, the</u>

23   <u>plurality of search patterns includes a complete match pattern of the respective sub-</u>

24   <u>expression, a partial match pattern of the respective sub-expression, and a mismatch pat-</u>

25   <u>tern including all don't care values.</u>

9. (Original) The method of claim 8 wherein each entry of the TCAM identifies a corresponding entry of the second memory device.

10. (Original) The method of claim 9 wherein at least one TCAM entry is associated with a next state variable, the method further comprising the step of loading the entry of the second memory device that is identified by the at least one TCAM entry with the associated next state variable.

11. (Original) The method of claim 10 wherein

the at least one TCAM entry is located in a TCAM section whose entries are associated with a current state variable having a first value, and

the next state variable has a second value that differs from the first value, thereby specifying a new TCAM section to be searched.

12. (Original) The method of claim 11 wherein each TCAM entry has a match cell that contains the complete match, the partial match or the mismatch pattern.

Claims 13-20. (Canceled)

21. (Previously Presented) The method of claim 1 wherein

each regular expression is associated with an action,

the pattern matching engine further includes a second memory device having a plurality of entries, and

the entries of the second memory device are loaded with the actions associated with the one or more regular expressions.

22. (Currently Amended) ~~The method of claim 21 wherein~~ A method for programming a pattern matching engine having a plurality of information storage entries with one or more regular expressions, each regular expression including a plurality of

4   characters and having a corresponding action to be applied to matching strings, the

5   method comprising the steps of:

6   _____ including at the pattern matching engine ~~has~~ at least one ternary content

7   addressable memory (TCAM) that supports don't care values, the TCAM loaded with the

8   one or more regular expression~~,~~; and

1   further including a second memory device having a plurality of entries for loading

2   actions corresponding to the one or more regular expressions wherein each entry of the

3   TCAM identifies a corresponding entry of the second memory device.

1   23. (Previously Presented) The method of claim 22 wherein at least one TCAM

2   entry is associated with a next state variable, the method further comprising the step of

3   loading the entry of the second memory device that is identified by the at least one

4   TCAM entry with the associated next state variable.

1   24. (Previously Presented) The method of claim 23 wherein

2   the at least one TCAM entry is located in a TCAM section whose entries are as-

3   sociated with a current state variable having a first value, and

4   the next state variable has a second value that differs from the first value, thereby

5   specifying a new TCAM section to be searched.

1   25. (Previously Presented) The method of claim 24 wherein each TCAM entry

2   has a match cell that contains the complete match, the partial match or the mismatch pat-

3   tern.

Please add claims 26 et seq:

1   26. (New) A switch comprising:

2   means for programming a pattern matching engine having a plurality of informa-

3   tion storage entries with one or more regular expressions, each regular expression includ-

4   ing a plurality of characters and having a corresponding action to be applied to matching

5   strings;

6   means for identifying one or more borders within a given regular expression, the

7   one or more borders separating the given regular expression into a plurality of sub-

8   expressions, at least one sub-expression having a plurality of sequential characters; and

9   means for loading one or more entries of the pattern matching engine with a plu-

10   rality of the sequential characters from at least one sub-expression, the entries stored in

11   content addressable memory (CAM).

1   27. (New) The switch of claim 26, further comprising:

2   means for organizing at least part of the CAM into a plurality of sections, and

3   wherein each section of the CAM is loaded with a plurality of search patterns for a corre-

4   sponding sub-expression.

1   28. (New) The switch of claim 26, further comprising:

2   means for associating at least one sub-expression with a current state variable; and

3   means for loading the associated current state variable into each entry of the CAM

4   that contains the at least one sub-expression.

1   29. (New) The switch of claim 26, further comprising:

2   means for associating each regular expression with an action;

3   means for including at the pattern matching engine a memory device having a

4 plurality of entries;

5   means for loading the memory device with the actions associated with the one or

6 more regular expressions.

1   30. (New) The switch of claim 26, further comprising:

2   means for using a ternary content addressable memory (TCAM) for the CAM,

3 each entry of the TCAM identifying a corresponding entry of the memory device.

1   31. (New) A switch comprising:

2   a pattern matching engine having a plurality of information storage entries con-

3 figured to program one or more regular expressions, each regular expression including a

4 plurality of characters and having a corresponding action to be applied to matching

5 strings;

6   the pattern matching engine configured to identify one or more borders within a

7 given regular expression, the one or more borders separating the given regular expression

8 into a plurality of sub-expressions, at least one sub-expression having a plurality of se-

9 quential characters; and

10   a content addressable memory (CAM), the CAM configured to store a plurality of

11 the sequential characters from at least one sub-expression.

1   32. (New) The switch of claim 31, further comprising:

2   at least part of the CAM organized into a plurality of sections wherein each sec-

3 tion is loaded with a plurality of search patterns for a corresponding sub-expression.

1   33. (New) The switch of claim 31, further comprising:

2   the pattern matching engine configured to associate at least one sub-expression

3   with a current state variable; and

4   the pattern matching engine configured to store the associated current state vari-

5   able into each CAM entry that contains the at least one sub-expression.

1   34. (New) The switch of claim 31, further comprising:

2   a memory device having a plurality of entries;

3   the memory device configured to store actions associated with the one or more

4   regular expressions.

1   35. (New) The switch of claim 31, further comprising:

2   the CAM configured as a ternary content addressable memory (TCAM), the

3   TCAM storing a corresponding entry for each entry of the second memory device.